In the Claims

1. (Original) A high-mannose oligosaccharide cluster comprising at least two high-mannose oligosaccharides positioned on a scaffolding framework.

2. (Currently amended) A ~~The~~ high-mannose oligosaccharide cluster comprising ~~according to claim 1, wherein~~ four high-mannose oligosaccharides ~~are~~ positioned on a ~~the~~ scaffolding framework.

3. (Original) The high-mannose oligosaccharide cluster according to claim 1, further comprising an immunogenic protein conjugated to the high-mannose oligosaccharide cluster thereby producing a high-mannose oligosaccharide/protein cluster.

4. (Original) The high-mannose oligosaccharide cluster of claim 2, wherein the four high-mannose oligosaccharides are Man_9.

5. (Currently amended) The high-mannose oligosaccharide cluster of claim 3, wherein the ~~four~~ high-mannose oligosaccharides are Man_9.

6. (Original) The high-mannose oligosaccharide cluster of claim 5, wherein the immunogenic protein is selected from the group consisting of keyhole limpet hemocyanin, tetanus toxoid, diphtheria toxoid ,bovine serum albumin, ovalbumin, thyroglobulin, myoglobin, cholera toxin β-subunit, immunoglobulin and/or tuberculosis purified protein derivative.

7. (Original) The high-mannose oligosaccharide cluster of claim 1, wherein the scaffolding framework comprises monosaccharides, cyclic peptides, cyclic organic compounds, or 11–bis-maleimidetetraethyleneglycol.

8. (Original) The high-mannose oligosaccharide cluster of claim 3, wherein the high-mannose oligosaccharides comprise any structural variant of Man_9, Man_8:, Man_7, Man_6, Man_5 or a combination thereof.

9. (Original) The high-mannose oligosaccharide cluster of claim 3 comprising four Man_9 covalently attached to a galactose scaffolding framework, wherein the immunogenic protein comprises keyhole limpet hemocyanin.

10. (Original) A pharmaceutical composition comprising the high-mannose oligosaccharide cluster of claim 3.

11. (Original) A pharmaceutical composition for reducing effects of Human Immunodeficiency Virus (HIV) infection, the composition comprising a therapeutically effective amount of the high-mannose oligosaccharide cluster of claim 3.

12. (Original) The pharmaceutical composition of claim 11, further comprising at least one antiviral agent.

13. (Original) A pharmaceutical composition for reducing effects of Human Immunodeficiency Virus (HIV) infection, the composition comprising a therapeutically effective amount of the high-mannose oligosaccharide cluster of claim 9.

14. (Original) The pharmaceutical composition of claim 13, further comprising at least one HIV antiviral agent selected from the group consisting of nucleoside RT inhibitors, CCR5 inhibitors/antagonists, viral entry inhibitors or functional equivalents thereof.

15. (Original) A method for generating a high-mannose oligosaccharide cluster, the method comprising:

covalently attaching at least one high-mannose oligosaccharide chain to a scaffold molecule thereby generating a high-mannose oligosaccharide cluster that mimics an antigenic structure having affinity for 2G12 antibodies.

16. (Original) The method according to claim 15, wherein the high-mannose oligosaccharide chain is extracted from the digestion of soybean agglutinin or produced by chemical synthesis.

17. (Original) The method according to claim 16, wherein the high-mannose oligosaccharide chains comprise any structural variant of Man_9, Man_8:, Man_7, Man_6, Man_5 or a combination thereof.

18. (Original) The method according to claim 16, wherein the scaffold framework comprises monosaccharides, cyclic peptides, cyclic organic compounds, or 11–bis-maleimidetetraethyleneglycol.

19. (Original) The method of claim 15, further comprising conjugating an immunogenic protein to the high-mannose oligosaccharide cluster.

20. (Original) A method of inducing production of HIV neutralizing antibodies that exhibit affinity for a conserved cluster of oligomannose sugars on gp120, the method comprising:

administering to an animal the high-mannose oligosaccharide according to claim 2 in an amount sufficient to induce production of antisera specific for the high-mannose oligosaccharide; and

collecting the antisera.

21. (Original) method of inducing production of HIV neutralizing antibodies that exhibit affinity for a conserved cluster of oligomannose sugars on gp120, the method comprising:

administering to an animal the high-mannose oligosaccharide according to claim 3 in an amount sufficient to induce production of antisera specific for the high-mannose oligosaccharide; and

collecting the antisera.

22. (Original) The method according to claim 21, wherein the high-mannose oligosaccharide chains comprise a structural variant of Man_9, Man_8:, Man_7, Man_6, Man_5 or a combination thereof.

23. (Original) The method according to claim 22, wherein the scaffold framework comprises monosaccharides, cyclic peptides, cyclic organic compounds, or 11–bis-maleimidetetraethyleneglycol.

24. (Original) The method according to claim 21, wherein the immunogenic protein is selected from the group consisting of keyhole limpet hemocyanin, tetanus toxoid, diphtheria toxoid ,bovine serum albumin, ovalbumin, thyroglobulin, myoglobin, cholera toxin β-subunit, immunoglobulin and/or tuberculosis purified protein derivative.

25. (Cancelled)

26. (Original) A therapeutically effective method of combating HIV virus infection, the method comprising:

administering to a subject a therapeutically effective amount of a composition comprising the high-mannose oligosaccharide of claim 3 to induce increased production levels neutralizing antibodies specific for a conserved cluster of oligomannose sugars on gp120.

27. (Original) The therapeutically effective method according to claim 26, wherein the high-mannose oligosaccharide chains comprise a structural variant of Man_9, Man_8:, Man_7, Man_6, Man_5 or a combination thereof.

28. (Original) The therapeutically effective method according to claim 27, wherein the scaffold framework comprises monosaccharides, cyclic peptides, cyclic organic compounds, or 11–bis-maleimidetetraethyleneglycol.

29. (Original) The therapeutically effective method according to claim 27, wherein the immunogenic protein is selected from the group consisting of keyhole limpet hemocyanin, tetanus toxoid, diphtheria toxoid ,bovine serum albumin, ovalbumin, thyroglobulin, myoglobin, cholera toxin β-subunit, immunoglobulin and/or tuberculosis purified protein derivative.

30. (Original) A method for detecting candidate compounds that potentially interact with a conserved cluster of oligomannose sugars on gp120, the process comprising:

contacting the candidate compound with the high-mannose oligosaccharide cluster according to claim 2; and

determining the binding affinity of the candidate compound for high-mannose oligosaccharide cluster.

31. (Original) The method according to claim 30, wherein the high-mannose oligosaccharide chains comprise a structural variant of Man_9, Man_8:, Man_7, Man_6, Man_5 or a combination thereof.

32. (Original) The method according to claim 31, wherein the scaffold framework comprises monosaccharides, cyclic peptides, cyclic organic compounds, or 11–bis-maleimidetetraethyleneglycol.

33. (Original) The method according to claim 31, wherein the immunogenic protein is selected from the group consisting of keyhole limpet hemocyanin, tetanus toxoid, diphtheria toxoid ,bovine serum albumin, ovalbumin, thyroglobulin, myoglobin, cholera toxin β-subunit, immunoglobulin and/or tuberculosis purified protein derivative.

34. (Original) An antibody exhibiting affinity for a high-mannose oligosaccharide cluster according to claim 3.

35.-38 (Cancelled)